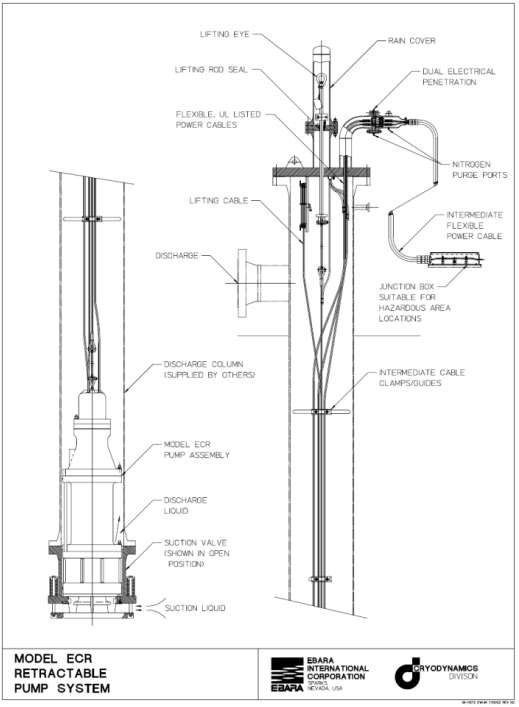

This unique design allows the pump to be installed inside a storage tank in a vertical pump column, with a suction (foot) valve located at the bottom. Because the pump is installed through the top of the tank, all connections below the maximum liquid level of the tank can be eliminated. This eliminates the possibility of major tank leakage due to a pipe or connection problem. It also permits the storage vessel to be located below ground level or completely covered by mounding. The applicable codes allow the owner to minimize the land area needed to locate a liquefied gas storage tank due to the reduction of spillage potential.

The submerged pump and motor unit is designed to fit into the smallest practical column diameter by using an axial diffuser design. The column then acts as a guide to seat the pump during installation and also as the discharge pipe from the pump to the top of the tank. Each pump is fitted with an inducer, which is an axial flow impeller located at the lowest possible level of the tank to improve the NPSHR (Net Positive Suction Head Required) and allow operators to lower tank liquid levels to extremely low levels. To isolate the tank contents from the pump column, a suction valve is used, which incorporates a dual pressure sensitive seal. The valve is flanged to the lower end of the pump column and is closed by coil springs as well as by the hydrostatic pressure of the liquid in the tank.

The valve is opened by lowering the pump into the valve. The inlet feet of the pump press down against the bottom plate, forcing the valve to open using the weight of the pump. The valve can also be closed by simply lifting up on the lifting eye located at the top of the column headplate, without dis-assembly of any other components. Once the valve is closed, the column can be inerted with nitrogen gas to allow the safe removal of the pump even with liquid in the tank. The power cables used in the retraction system are a high quality armored cable, made especially for Cryodynamics. These cables are UL (Underwriter's Laboratory) listed, and were developed specifically for use in cryogenic liquids. The lifting cables used are an anti-twist, stainless steel cable, which can provide many years of use without replacement.